



The ClearingHouse for Inventories and Emission Factors

CHIEF

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The 1990 Baseline Inventory for Section 112(k)

Laurel Driver and Anne Pope

Section 112(k) of the Clean Air Act requires EPA to identify at least 30 hazardous air pollutants (HAPs) “which, as the result of emissions from area sources, present the greatest threat to public health in the largest number of urban areas” and to subject to regulation those area sources accounting for 90 percent of the emissions. In order to meet this requirement, EPA used a combination of available emissions inventory data (using a 1990 baseline), toxicity benchmarks, ambient monitoring measurements, and existing local studies to identify a list of candidate HAPs for inclusion in the “dirty thirty.” Once this list was narrowed down from the 188 HAPs listed in the CAA, the Emissions Factor and Inventory Group (EFIG) re-evaluated emissions estimates of these HAPs. The candidate HAPs inventory has received extensive review internal and external to EPA. A Federal Register Notice regarding how EPA plans to meet the Section 112(k) requirements is scheduled for a June 1999 completion date. The EFIG’s technical support document “Emissions Inventory of 40 Candidate Section 112(k) Pollutants; Supporting Data for EPA’s Section 112(k) Regulatory Strategy” will be available along with the Federal Register Notice at www.epa.gov/ttn/uatw/112k/112kfac.html.

The 1996 National Toxics Inventory

Laurel Driver and Anne Pope



The EPA has routinely collected emissions inventory data for criteria pollutants for about 20 years. Section 112 of the 1990 Amendments to the CAA provided a new focus on hazardous air pollutants (HAPs) that resulted in a need for HAP emissions inventories. The CAA requires EPA to identify HAP sources, quantify the emissions by source category, develop regulations for each source category, and assess the public health and environmental impacts after regulations are implemented.

As EPA began to implement the requirements of the 1990 CAA, a strong need became clear for a central repository of air toxic emissions inventory data from which to conduct the analyses required by the CAA. Inherent in the CAA program requirements is recognition that there is no single air toxics problem. Rather, various health and environmental problems are caused by individual air toxics and mixtures of air toxics. Therefore, the various needs for air toxic data cover major, area, and mobile sources and include estimates of emissions at the national, regional, county, and facility-specific levels, and even down to process-specific emission data for modelers. In 1993, OAQPS recognized the need for HAP emission inventories and began developing the National Toxics Inventory (NTI), a national repository of emission inventory data for HAPs. The original version of the NTI represents a 1990 to 1993 baseline that will be used to track future changes in HAP emissions nationwide. However, no facility-specific HAP emissions data are in the baseline NTI. For the next version of the NTI, a 1996 base year, OAQPS is developing a model-ready HAP emissions inventory

for use in dispersion and exposure modeling. The 1996 NTI will contain comprehensive, facility-specific HAP emissions data and source-specific parameters that are needed to support dispersion modeling. The data structure of the 1996 base year NTI allows the data to be used for a variety of purposes. On May 3, 1999 the draft 1996 NTI became available for review by state and local agencies. The final product is scheduled for completion by October 1, 1999. For more information about the 1996 NTI contact Anne Pope at (919) 541-5373 or Laurel Driver at (919) 541-2859.

Periodic Emission Inventories

Douglas Solomon

The Emission Factor and Inventory Group (EFIG) is currently working on a major effort to update the 1996 National Emissions Trends (NET) Inventory with State data. The EFIG solicited emission inventory data from the States including 1996 Periodic Emissions Inventories (PEIs) required for ozone and CO nonattainment areas and 1996 annual point source data. State data received by EFIG by March 1, 1999 will be incorporated in the revised NET Inventory to be released at the end of the year. The revised 1996 NET data will also be used as the basis for revised 1997 NET data and for the initial 1998 NET data.

As of March 1, EFIG received emission data from 32 States and the District of Columbia. All States submitting data supplied data for their point sources. In addition to the point source data, 10 States provided some area and/or nonroad source data. All State data submitted included emission estimates of VOC, NO_x, and CO. Most States also provided emission estimates of SO₂ and PM and submitted data to EFIG through AIRS-AFS or the new NET Input Format.

The revised NET Inventory with the 1996 State data incorporated is scheduled for release this fall. The data will be available via the National Air Pollutant Emission Trends Report and the Internet.



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The CHIEF Newsletter is produced quarterly by the Emission Factor and Inventory Group; Emissions, Monitoring, and Analysis Division; of EPA's Office of Air Quality Planning and Standards. Its purpose is to enhance communication within the emission factor and inventory community by providing new and useful information and by allowing for the exchange of information between and among its readers. Comments on the Newsletter and articles for inclusion in it are welcome and should be directed to Emission Factor and Inventory Group (MD-14), US EPA, Research Triangle Park, NC 27711; telephone (919) 541-3269.

The contents of The CHIEF Newsletter do not necessarily reflect the views and policies of the Agency, neither does the mention of trade names or commercial products constitute endorsement or recommendation for use.

FIRE Version 6.2 AND Version 6.21

Ron Ryan



The Emission Factor and Inventory Group (EFIG) released Version 6.21 of the Factor Information Retrieval (FIRE) data system via the CHIEF web site (<http://www.epa.gov/ttn/chief/fire.html>) on May 19, 1999. FIRE provides a searchable, electronic file of EPA recommended emission factors for both criteria and toxic pollutants, and a complete listing of both the point and area Source Classification Codes (SCCs) used for categorizing emission processes in inventories. This release was made just a month after FIRE v6.2 was released, in order to fix some minor software bugs that had come to light. We also took advantage of the opportunity to correct a few emission factor typos that had been pointed out to us by users. We greatly appreciate these comments as a way to make the software more useful to you and to weed out data entry errors. We do not anticipate another release of FIRE before October, but we will post any additional errors or bugs found on the CHIEF web site alongside the FIRE v6.21 software. Please send any comments or questions to Ron Ryan at 919-541-4330 or ryan.ron@epa.gov.

MAJOR New Features Introduced in FIRE v6.2.

Both FIRE Version 6.2 and 6.21 contain all SCCs and emission factors from AP-42 sections finalized before March 15, 1999. FIRE Version 6.2 introduced a couple of new features that you may find useful. Users can now select whether they want to View only current emission factors or only AFS (uncontrolled criteria pollutant) factors or all factors, including those replaced by current factors. Indicators have been added to the bottom of the Browse page to show which set of factors is being viewed. In addition, the single thruput units field for each SCC has been split into three separate fields, to individually identify the units of measure, the material being measured, and what is being done to that material. Each of these new fields has been completely populated and checked to insure that a given unit of measure or material always appears the same. These changes were made to allow for easier and more accurate imports to other electronic systems' emission factor and SCC tables, and to allow compatibility with EPA's National Emission Trends (NET) inventory. All of the units, of measure, materials, and actions, appearing in FIRE will be supported in the NET input format.

SOFTWARE Corrections Made in Version 6.21.

In Version 6.2, when exporting factors from the FILE/SAVE menu, the incorrect SCC description was exported to the database or ASCII text output file, although the correct SCC code number was exported. The correct SCC description is now exported.

Formula-type emission factors did not display or export correctly in version 6.2 for factors that were also flagged as being "derived" from another SCC. This has been corrected.

The font size used on the DETAIL screen was too small on some monitors in version 6.2. A slightly larger font is now used.

The indication of whether the selected emission factor was in standard AIRS AFS units on the DETAIL screen and in exports was not stable and not always correct. This has been corrected in Version 6.21 by adding a static AFS flag field, rather than performing an "on-the-fly" comparison.

We have also heard from one user that the several characters of an emission factor, but not the EF units, will write over each other on the DETAIL screen, possibly only on Windows NT installations. We

have not been unable to replicate this problem on our NT machines, and so we have no fix for this at this time. It may be due to the parameters set for the one particular NT installation.

Significant EMISSION FACTOR Typo Corrections Made in Version 6.21.

In Version 6.2, manganese emission factors for SCCs 101006-01, -02, -04 and 102006-01, 02 and 103006-01, -02, -03 contained “E-E” instead of “E-04”. These factors are now corrected to 3.8E-04 lb/million scf.

The units for the fabric filter controlled PM and PM10 emission factors for SCC 3-05-015-21 and -22 were corrected to “Lbs per MILLION Square Feet Board Sawed” from “Lbs per THOUSAND Square Feet Board Sawed”.

How Can I Identify Emission Factor Changes from Version to Version?

Users trying to ascertain what has changed in the FIRE database tables from one release version to the next should review the contents of the FIRE database fields CREATED, REVOKED and UNIQID. The CREATED and REVOKED fields are date fields that indicate when a factor was added or removed from “current records” of the FIRE database. These two fields have been used for records created or revoked since September 1, 1997. Both fields will be blank for older records which are still “current”.

The UNIQID field is a unique identifier for each FIRE record. All unique IDs begin with the FIRE version number in which the factor was introduced. Unique IDs beginning with “F5C” or “F5T” are from the FIRE Version 5 Criteria and Toxics modules, respectively. The last 6 digits of the unique ID is the record number of the original criteria or toxics module database. Newer factors have a unique IDs beginning with “F6nnn” with the “nnn” indicating the exact FIRE Version 6 in which the factor was introduced.

EFIG Sharpens Definition of Particulate Matter

William Kuykendal



As we transition into the era of the new fine particle standard, it has become apparent that a more specific definition of particulate matter is needed for emission reporting purposes. Several factors have influenced this. One of the main factors is an increased awareness of the importance of condensible emissions. Also important is an understanding of particles that are formed in the atmosphere and how they should be treated in the inventory. In addition, it is also important to keep track of particulate matter emissions by size; specifically PM10 and PM2.5. We considered all of these factors and developed the following definitions:

■ **PRIMARY PM:** Particles that enter the atmosphere as a direct emission from a stack or an open source. It is comprised of two components: Filterable PM and Condensible PM.

◆ **Filterable PM:** Particles that are directly emitted by a source as a solid or liquid at stack or release conditions and captured on the filter of a stack test train.

◆ **Condensible PM:** Material that is vapor phase at stack conditions, but which condenses and/or reacts upon cooling and dilution in the ambient air to form solid or liquid PM immediately after discharge from the stack.

■ **Secondary PM:** Particles that form through chemical reactions in the ambient air well after dilution and condensation have occurred. Secondary PM is usually formed at some distance downwind from the source. Secondary PM is NOT reported in the emission inventory. Rather, secondary PM is calculated by the atmospheric models from precursors that are included in the inventory such as SO₂, NO_x, VOC and NH₃.

The particle size, both PM_{2.5} and PM₁₀, of Primary PM is all considered to be in the PM_{2.5} fraction, in practice, this means reporting the Filterable component of Primary PM by particle size.

The National Emission Trends database has been developed to accommodate this level of particulate matter definition. This capability has been developed out of the necessity to support the fine particle standard. The EPA recognizes that the States will not have much of the particulate matter component data. However, by providing these definitions, EPA hopes that the States will be precise in specifying what particulate matter data they are reporting.



Strategy For Collecting Emission Inventory Data

Lee Tooty

The EPA's strategy for collecting criteria and toxic emission inventory data consists of data development, storage, transfer, usage, and availability. Each of the components are described briefly:

Data Development - State and Local agencies develop inventories and store the data on their own systems. State and Local agencies periodically transfer data to EPA/ Emission Factor and Inventory Group (EFIG) for processing into the national emission inventory. As necessary, EFIG aug-

ments data to produce a consistent national inventory that may be used as a starting point for regional air quality modeling.

Data Storage - State and Local agencies will store their own emission inventory data. The EPA will store the national inventory (a blend of S/ L and EPA developed emission inventory data) in the NET database.

Data Transfer - Current and future electronic data transfer options for State / Local agencies emphasize the NET Input Format, and possibly Electronic Data Interchange (EDI).

Data Usage - The national emission inventory stored in the NET database may serve as a starting point for EPA, Regional, and State air quality modeling. The criteria and toxic emission data in the national inventory will be the basis for the National Emission Trends Report and EPA regulatory analysis (i.e., the TIER II rulemaking, etc.). The national inventory data is also a source of public information.

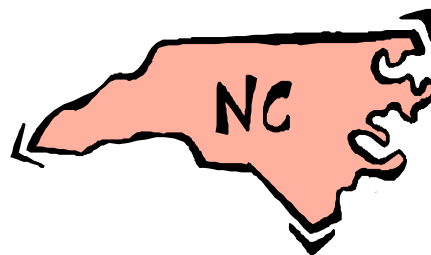
Data Availability - All NET data is public. Extensive Internet access is planned for the NET database. Emission pre-processor ready files will be available from the NET. The NET data will continue to be summarized and published annually in the EPA's National Emission Trends Report.

All State / Local agencies should now be investing some time toward learning and using the NET Input Format to transfer their emission inventory data (point, area, on road mobile, nonroad mobile, and biogenic) to the EPA. The NET Input Format and all of the associated user documentation may be obtained from www.epa.gov/ttn/chief/ei/eisubmit.htm. A training session on the NET Input Format was held during the recent (April) AIRS Conference to orient State / Local users to the Format and how to implement it successfully. A second and similar training session for State / Local users is currently planned as part of the Air & Waste Management Association Emission Inventory Conference (October 26-28, 1999 in Raleigh, NC).

As described in the April 21, 1999 memo from EPA's OAQPS & OECA - to the AFS User Community, the emissions component of AIRS / AFS will be closed out on September 30, 2000. Users will no longer be able to enter their point source emissions data into AFS after that date. A utility is being developed by OAQPS to extract data from AFS, and place it in the NET Input Format. The EFIG will use the convertor to help extract point source data (for years 1996 - 2000) that may be loaded by S / L's through September 1999. The completion of the convertor is targeted for Summer 1999. A second utility is also being developed by OAQPS for S/L's to use locally to convert the AFS batch transaction format to the NET Input Format. The completion of that utility is targeted for Spring 2000.

Emission Inventory Conference

Roy Huntley



The Emission Inventory: Regional Strategies for the Future will be held October 25-28, 1999 at the Sheraton Capital Center in downtown Raleigh, North Carolina. This is the ninth annual international symposium on emission inventories sponsored by the Air & Waste Management Association and the U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emission Factor & Inventory Group.

The primary focus of the Emission Inventory Conference will be the improvement of the emission inventory process and utilization of emissions data in national and regional control strategies. Other topics will be related to the industrial experiences and concerns with inventories of air pollution emissions and the methods used to estimate emissions. Papers will be presented in the following areas; Mobile Sources, Area Sources, Air Toxics, Ammonia Emissions, Emission Factors for Point Sources, Greenhouse Gases, Source Specific Inventories, Quality Assurance for Emission Inventories, Inventory Preparation for Air Quality Modeling, Projections, and Emissions/Monitoring/Modeling Relationships

This conference will provide a useful forum for exchange of ideas and information on the use of emission data between industry, the U.S. EPA, State agencies, and the public.

Who Should Attend? State/Local Air Agency Emission Inventory Preparers Air Emissions Data Managers Air Dispersion Modelers Industry Emission Inventory Specialists Air Quality Managers Air Toxics Personnel Emission Forecasters Environmental Consultants

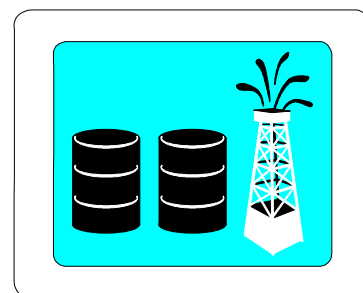
Poster presentations are invited. Send a 200-400 word abstract to the Technical Program Chair, Roy Huntley, c/o Sally Dombrowski, U. S. Environmental Protection Agency, MD-14, Research Triangle Park, NC 27711; Tel: (919) 541-3269; Fax: (919) 541-0684; e-mail: dombrowski.sally @epa.gov. Include a complete mailing address, telephone and fax numbers and e-mail address.

TANKS, Version 4.0

Dennis Beauregard

TANKS is EPA's model for estimating volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions from organic liquid storage tanks. If you're a TANKS user, you'll be happy to know that Version 4.0 of the model is now posted on the CHIEF Web site. This model is a departure from the earlier, DOS versions of TANKS. First, it's programmed using Visual Basic 6.0 so it will be fully compatible with Windows operating systems. Second, there are two versions of the model available: a 16 bit version for users of Windows 3.1 and a 32 bit version for users of Windows 95, 98 and NT 3.51 and later.

Despite the new look, the equations and the inputs to those equations are unchanged from TANKS 3.1 so you can continue to use the DOS version of the model with only minor differences in the calculated emissions. The minor differences will be the result of updated meteorological data and the use of city specific atmospheric pressure data.



For those of you who have recently visited the TANKS page of the CHIEF Web site, you may have noticed that we've removed TANKS Versions 2.0 and 3.0. Since the mission of the Emission Factor and Inventory Group (EFIG) is to support the latest emission estimation techniques, it didn't make sense to keep the older versions posted. As a practical matter, it would have been fairly cluttered having TANKS Versions 2.0, 3.0, 3.1, 4.0 (16 bit) and 4.0 (32 bit) posted for downloading. There may have been some confusion with so many versions posted. We do intend to leave TANKS 3.1 posted to continue our support for any DOS operating system users that might still be out there. We'll monitor downloads of Version 3.1 and remove it from the TANKS page if it becomes evident that we have few TANKS users with DOS operating systems.

When we've released earlier versions of TANKS, we've coordinated those releases with updates of Section 7.1 of AP-42. Since TANKS is an extension of Section 7.1 of AP-42 (which has grown to 100 pages), hand calculations using AP-42 should agree with the estimates generated by TANKS. It was not necessary to update AP-42 at this time since the focus of this effort was to convert TANKS from a DOS program to a Windows program while leaving the calculational routines untouched.

Info CHIEF's Most Frequently Asked Questions
Call (919) 541-5285 or email info.chief@epamail.epa.gov
if you have questions!

Although the calculations and the inputs to those equations were not modified, because we updated the meteorological database and added information on atmospheric pressures, there could be minor differences in calculated emissions compared to results from TANKS Version 3.1 and the AP-42 Section. However, because of the minor nature of the data changes, it seemed less critical to coordinate updating the AP-42 Section with the release of the model.

Generating a new piece of software presented an opportunity to add a few enhancements to TANKS. The following features are new:

- Default liquid speciation profiles for crude oil and selected petroleum products have been added to facilitate HAP emission calculations. This information came from several published sources: the Gasoline Bulk Terminal MACT, Toxics Release Inventory Guidance for Gasoline Bulk Terminals and the American Petroleum Institute's Manual of Petroleum Measurement Standards, Chapter 19.4 - Recommended Practice for Speciation of Evaporative Losses.
- It is now possible to add new loss factors for internal floating roof deck seams.
- The number of days in each month are now used to calculate all standing losses. The previous versions of TANKS equally divided the loss among the months.
- Monthly calculation procedures have been greatly simplified.
- TANKS 4.0 is Y2K compliant. Earlier versions of the model are also believed to be compliant since there's no date sensitive information, but we took care in developing this model to ensure that Y2K would not be a problem.

We're already thinking about TANKS 4.1. There are some things we could do such as adding modules for estimating emissions from floating roof landing losses and from fixed roof tanks operated as low pressure tanks. If there are other improvements you'd like to see or software modifications you think might improve TANKS 4.0, you can e-mail your thoughts to me at "dbeaureg@epa.gov."